

Title: To Evaluate The Association Of Subclinical Atherosclerosis In Chronic Obstructive Pulmonary Disease Patients With Metabolic Syndrome- A Hospital Based Case Control Study

Background:

COPD is a multicomponent disease with inflammation at its core leading to mortality. COPD can overdrive metabolic syndrome through systemic inflammation and metabolic syndrome can adversely affect COPD. COPD patients with metabolic syndrome have a higher degree of subclinical atherosclerosis. Carotid atherosclerosis strongly correlates with coronary atherosclerosis and carotid intima-media thickness (CIMT) measured by carotid doppler ultrasound is an effective, validated method for evaluating carotid atherosclerosis. Both COPD and metabolic syndrome contribute to atherosclerosis by systemic inflammation and thereby contributing to increased cardiovascular diseases. Increased CIMT is associated with increased total and cardiovascular mortality in patients with COPD suggesting that CIMT measurement may be a good biomarker to assess the cardiovascular morbidity and mortality in these patients. Comorbidities associated with COPD is an area of research and there are not many studies done in India to establish the association of COPD with Metabolic syndrome and carotid intima media thickness.

Aims & objectives:

1. TO EVALUATE THE ASSOCIATION OF SUBCLINICAL ATHEROSCLEROSIS IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS WITH METABOLIC SYNDROME.
2. TO EVALUATE THE ASSOCIATION OF SUBCLINICAL ATHEROSCLEROSIS IN DIFFERENT STAGES OF COPD.
3. TO STUDY THE CLINICAL AND FUNCTIONAL DIFFERENCES IN COPD PATIENTS WITH AND WITHOUT METABOLIC SYNDROME.

Methodology:

A prospective Hospital based case control study. Study center- Rajiv Gandhi government general hospital, Madras Medical College, Chennai. Study duration- Jan 2017 to August 2017. Sample size: cases-42, control 1-42 & control 2-42. In our OPD, COPD was diagnosed by GOLD 2017 guidelines. Metabolic syndrome was diagnosed by NCEP ATP 3 Criteria. Cases(42)-COPD with metabolic syndrome. Control 1(42)- COPD without metabolic syndrome. Control 2(42)- Age and sex matched healthy volunteers. In study groups, mMRC dyspnea scale, CAT score, Number of exacerbations, 6MWD, BODE index, ABG, Echocardiography and CIMT & Carotid plaque formation by using 2D Carotid Doppler were studied. Statistical analysis using Spss version 16.0 was done.

Results:

COPD patients with metabolic syndrome significantly ($P < 0.05$) had higher number of exacerbations, increased severity of airflow limitation, poorer exercise capacity, lower 4 year survival prediction rate, higher CO_2 retention and increased right ventricular dysfunction. Average CIMA (1.008mm vs 0.826mm vs 0.661mm) & Carotid plaque formation (28.6% vs 7.1% vs 0) were significantly higher in cases. By multiple linear regression analysis, %FEV1 predicted and smoking packyears were independent risk factors for elevated CIMA. Increased CIMA was associated with increase in severity of airflow limitation ($p < 0.004$), increase in BODE index ($p < 0.002$) and decrease in 6MWD ($P < 0.003$).

Conclusion:

In COPD patients, prevalence of metabolic syndrome is more common and it is associated with worsened clinical and functional characteristics. Both COPD and METABOLIC SYNDROME can cause progression of atherosclerosis and are associated with increased cardiovascular mortality. COPD patients with metabolic syndrome have poor prognosis and they are high cardiovascular risk phenotype. CAROTID INTIMA MEDIA THICKNESS AND CAROTID PLAQUE formation can be routinely screened in all the COPD patients. Thus non-invasive and cost effective 2D carotid Doppler as a part of investigation panel for cardiovascular disease risk prediction can help us to decrease the cardiovascular morbidity and mortality associated with COPD.

Key words: chronic obstructive pulmonary diseases, metabolic syndrome, carotid intima media thickness, carotid plaque, cardiovascular mortality, systemic inflammation.

References:

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